AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Original) A nanocomposite electrolyte membrane for a fuel cell, comprising:

a polymer having cation exchange groups; and

silicate nanoparticles dispersed in the polymer, the silicate nanoparticles having a layered structure, and the silicate nanoparticles being intercalated with the polymer, or layers of the silicate nanoparticles being exfoliated.

2. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the silicate is selected from the group consisting of smectite, vermiculite, halloysite, sericite, mica, and a mixture of the forgoing materials.

3. (Previously Presented) The nanocomposite electrolyte membrane of claim 2, wherein the silicate comprises smectite and the smectite is selected from the group consisting of montmorillonite, saponite, beidellite, nontronite, hectorite, stevensite, and a mixture of the forgoing materials.

4. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the silicate nanoparticles have an average diameter of 1-100 nm.

5. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the amount of the silicate nanoparticles is in a range of 1-30% based on the total weight of the nanocomposite electrolyte membrane.

6. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the cation exchange groups of the polymer are selected from the group consisting of a sulfonate acid group, a carboxyl group, a phosphoric acid group, an imide group, a sulfonimide group, a sulfonamide group, and a hydroxyl group.

7. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the polymer with cation exchange groups is a homopolymer or a copolymer of trifluoroethylenes, tetrafluoroethylenes, styrene-divinyl benzenes, α,β,β-trifluorostyrenes, styrenes, imides, sulfones, phosphazenes, etherether ketones, ethylene oxides, polyphenylene sulfides, or aromatic groups, or a derivative of the homopolymers and the copolymers, or a mixture of the forgoing materials.

8. (Original) The nanocomposite electrolyte membrane of claim 1, wherein the polymer is a highly fluorinated polymer with sulfonate groups as proton exchange groups at the terminals of side chains and containing fluorine atoms that amount to at least 90% of the total number of fluorine and hydrogen atoms bound to carbon atoms of the backbone and side chains of the polymer.

9. (Original) The nanocomposite electrolyte membrane of claim 1, having a thickness of 30-200 μm.

10. (Previously Presented) A fuel cell comprising:

a cathode where a reduction of an oxidizing agent occurs;

an anode where an oxidation of fuel occurs; and

the nanocomposite electrolyte membrane according to claim 1 interposed between the cathode and the anode.

11. (Original) The fuel cell of claim 10, wherein the cathode comprises a catalyst layer containing carbon supported platinum catalyst.

12. (Original) The fuel cell of claim 10, wherein the anode comprises a catalyst layer containing carbon supported platinum catalyst.

13. (Original) The fuel cell of claim 10, wherein the anode comprises a catalyst layer containing carbon supported platinum-ruthenium catalyst.

14. (Previously Presented) The fuel cell of claim 10, wherein the silicate is selected from the group consisting of smectite, vermiculite, halloysite, sericite, mica, and a mixture of the forgoing materials.

15. (Previously Presented) The fuel cell of claim 14, wherein the silicate comprises smectite and the smectite is selected from the group consisting of montmorillonite, saponite, beidellite, nontronite, hectorite, stevensite, and a mixture of the forgoing materials.

16. (Previously Presented) The fuel cell of claim 10, wherein the silicate nanoparticles have an average diameter of 1-100 nm.

17. (Previously Presented) The fuel cell of claim 10, wherein the amount of the silicate nanoparticles is in a range of 1-30% based on the total weight of the nanocomposite electrolyte membrane.

18. (Previously Presented) The fuel cell of claim 10, wherein the cation exchange groups of the polymer are selected from the group consisting of a sulfonate acid group, a carboxyl group, a phosphoric acid group, an imide group, a sulfonimide group, a sulfonamide group and a hydroxyl group.

19. (Previously Presented) The fuel cell of claim 10, wherein the polymer with cation exchange groups is a homopolymer or a copolymer of trifluoroethylenes, tetrafluoroethylenes, styrene-divinyl benzenes, α,β,β – trifluorostyrenes, styrenes, imides, sulfones, phosphazenes, etherether ketones, ethylene oxides, polyphenylene sulfides, or aromatic groups, or a derivative of the homopolymers and the copolymers, or a mixture of the forgoing materials.

20. (Previously Presented) The fuel cell of claim 10, wherein the polymer is a highly fluorinated polymer with sulfonate groups as proton exchange groups at the terminals of side chains and containing fluorine atoms that amount to

at least 90% of the total number of fluorine and hydrogen atoms bound to carbon atoms of the backbone and side chains of the polymer.

21. (Previously Presented) The fuel cell of claim 10, wherein the nanocomposite electrolyte membrane has a thickness of 30-200 μm.

22. (Previously Presented) The nanocomposite electrolyte membrane of claim 1, further comprising a cationic surfactant, wherein the cationic surfactant comprises organic onium cations.

23. (Previously Presented) The nanocomposite electrolyte membrane of claim 22, wherein the organic onium cations comprise cetylpyridium chloride, lauryl pyridium chloride, or n-hexadecyl trimethylammonium bromide.

24. (Previously Presented) The fuel cell of claim 10, further comprising a cationic surfactant, wherein the cationic surfactant comprises organic onium cations.

25. (Previously Presented) The fuel cell of claim 24, wherein the organic onium cations comprise cetylpyridium chloride, lauryl pyridium chloride, or n-hexadecyl trimethylammonium bromide.

26. (Previously Presented) A nanocomposite electrolyte membrane for a fuel cell consisting essentially of:

a polymer having cation exchange groups;

silicate nanoparticles dispersed in the polymer; and

cationic surfactant adsorbed within the silicate nanoparticles.

27. (Previously Presented) The nanocomposite electrolyte membrane of claim 26, wherein the cationic surfactant comprises organic onium cations.

28. (Previously Presented) The nanocomposite electrolyte membrane of claim 27, wherein the organic onium cations comprise cetylpyridium chloride, lauryl pyridium chloride, or n-hexadecyl trimethylammonium bromide.

29. (Previously Presented) A method of forming a nanocomposite electrolyte membrane, comprising:

mixing silicate nanoparticles with surfactant, water and a polymer having cation exchange groups; and

drying the mixture to form a nanocomposite electrolyte membrane.

30. (Currently Amended) ~~The nanocomposite electrolyte membrane of claim 1,~~ A nanocomposite electrolyte membrane for a fuel cell, comprising:

a polymer having cation exchange groups; and

silicate nanoparticles dispersed in the polymer, the silicate nanoparticles having a layered structure, and the silicate nanoparticles being intercalated with the polymer, or layers of the silicate nanoparticles being exfoliated; wherein the polymer having cation exchange groups comprises:

a homopolymer derived from monomers having the formula of $MSO_2CFR_fCF_2O[CFYCF_2O]_nCF=CF_2$ and a copolymer derived from the monomers of the formula above and at least one monomer selected from the group consisting of ethylene, halogenated ethylene, perfluorinatedα-olefin, perfluoroalkylvinyl ether, wherein R_f is a radical selected from fluorine and a C_1-C_{10} perfluoroalkyl group; Y is a radical selected from fluorine and a trifluoromethyl group; *n* is an integer from 1 to 3; and M is a radical selected from fluorine, a hydroxyl group, an amino group, and a –OMe where Me is a radical selected from alkaline metal and a quaternary ammonium group;

a polymer having the carbon backbone substantially substituted with fluorine and pendant groups having the formula of $-O-[CFR'_f]_b[CFR_f]_aSO_3Y$ where *a* is an integer from 0 to 3; *b* is an integer from 0 to 3; *a+b* is greater than or equal to 1; R_f and R'_f are independently selected from halogen atom and a substantially fluorinated alkyl group; and Y is hydrogen or alkaline metal; or

a sulfonic fluoropolymer having the fluorinated backbone and pendent groups having the formula of $ZSO_2-[CF_2]_a-[CFR_f]_b-O-$ where Z is halogen, alkaline metal, hydrogen, or –OR where R is a C_1-C_{10} alkyl or aryl radical; *a* is an integer from 0 to 2; *b* is an integer from 0 to 2; *a+b* is not equal to zero; and R_f is selected from fluorine, chlorine, a C_1-C_{10} perfluoroalkyl group, and a C_1-C_{10} fluorochloroalkyl group.